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The specimen shown in this plate is a human liver, removed from a patient who died of a disease of the liver. The liver is shown in its natural position, with the stomach and other abdominal organs removed. The liver is a large, lobulated organ, and its surface is covered with a network of blood vessels and bile ducts. The illustration shows the liver from a superior view, with the major vessels and ducts clearly visible. The letters A through Z and the numbers 1 through 12 are used to label the various parts of the liver and its associated structures.

MR BUTCHER'S REPORTS ON OPERATIVE SURGERY

LOCATION OF LIVER IN THE ABDOMEN FROM THE
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*To Sir J. Paget-Baill: F.R.S.
with Mr. Butcher's Compliments
best respects*

REPORTS

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IN

OPERATIVE SURGERY.

NOVEMBER, 1881.

BY

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ETC., ETC., ETC.

Illustrated with Lithographs accurately traced from Photographs.

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1881.



REPORTS

IN

OPERATIVE SURGERY.

NOVEMBER, 1881.

I WISH to comply with the request of some friends of mine in placing on record the following rare cases in Operative and Practical Surgery, with observations suitable to each :—

- I. ENORMOUS INGUINAL ANEURISM CURED BY LIGATURE OF THE EXTERNAL ILIAC ARTERY HIGH UP ; DEATH OF PATIENT EIGHT YEARS AFTER THE OPERATION ; SHORT HISTORY OF THE CASE AND THE POST MORTEM APPEARANCES, AND THE CONDITION OF THE VASCULAR SYSTEM IN BOTH LIMBS, ILLUSTRATED BY A BEAUTIFUL PLATE TAKEN MOST ACCURATELY FROM THE PREPARATION IN MY MUSEUM.
- II. DEPRESSED PART OF FRONTAL BONE FROM GUNSHOT WOUND ; CONSIDERABLE DEPOSITS BEHIND OCCURRING SOME TIME AFTER THE ACCIDENT, PRODUCING PRESSURE ON THE BRAIN ; FITS AND MADNESS ; OPERATION OF TREPHINING PERFECTLY SUCCESSFUL IN REMOVING ALL SYMPTOMS ; RECOVERY.
- III. DEPRESSED FRACTURE AT THE LOWER ANGLE OF THE PARIETAL BONE AND SQUAMOUS PORTION OF THE TEMPORAL, CAUSED BY THE KICK OF A HORSE ; FITS, INABILITY TO DO ANY WORK ; THE SEAT OF INJURY TREPHINED, AND PERFECT RECOVERY ; WORKING WITH HIS EMPLOYER FOR YEARS AND NO INCONVENIENCE OF ANY KIND SINCE THE OPERATION.
- IV. SUICIDAL WOUND OF THE THROAT IMPLICATING THE TRUNK OF THE COMMON CAROTID LOW DOWN, SUCCESSFULLY LIGATURED ABOVE AND BELOW THE WOUND ; PERFECT RECOVERY.

- V. VERY LARGE SPINA BIFIDA, INVOLVING THE ENTIRE CERVICAL REGION, TREATED BY A NEW OPERATION; CHEMICAL ANALYSIS OF THE FLUID, MOST ACCURATELY TAKEN, DISPROVING MANY OF THE IDEAS FLOATING THROUGH THE CLASS-BOOKS OF THE DAY.
- VI. EXTENSIVE DISEASE OF THE LOWER END OF THE THIGH BONE; LARGE PROJECTING PIECE THREATENING THE POPLITEAL VESSELS; THE ENTIRE CUT OUT BY A MOST FORMIDABLE OPERATION; PERFECT RECOVERY, WITH ENTIRE USE OF THE LIMB.
- VII. DOUBLE COMPLICATED HARE-LIP OF THE GRAVEST FORM, WITH DOUBLE-CLEFT PALATE HARD AND SOFT; INTER-MAXILLARY BONES UNITED IN A SOLID MASS, THE VOMER BEING GREATLY THICKENED AND EXPANDED FROM THE POINT OF THEIR ATTACHMENT, THE ENTIRE STANDING PROMINENTLY FORWARD WITH FOUR CROOKED TEETH; THE NOSE WAS THRUST ENTIRELY OVER TO THE LEFT SIDE, ITS MASSIVE APEX POINTING MOST REMARKABLY IN THAT DIRECTION, WHILE THE ALÆ WERE SPREAD OUT QUITE HORIZONTALLY, SO THAT A MORE HIDEOUS ARRANGEMENT COULD NOT BE DEPICTED; CURED WITHOUT DEFORMITY.
- VIII. HORRID COMPLICATED SINGLE HARE-LIP; SINGLE FISSURE THROUGH LEFT SIDE, THROUGH HARD AND SOFT PALATES; VERY WIDE IN FRONT, THE GAP FREELY ADMITTING THE THUMB; AND THIS SPACE BEING DUE TO THE REMARKABLE WAY IN WHICH THE UNITED OSSA INCISIVA ATTACHED TO THE RIGHT SUPERIOR MAXILLARY BONE STOOD PROMINENTLY, ALMOST STRAIGHT, FORWARD AND EVEN ABOVE AND TO THE RIGHT OF THE TIP OF THE NOSE; CURED WITHOUT DEFORMITY.

CASE I.—*Enormous Inguinal Aneurism cured by Ligature of the External Iliac Artery high up; Death of Patient eight years after the operation; Short History of the Case and the post mortem appearances, and the Condition of the Vascular System in the Limbs, illustrated by a beautiful Plate taken most accurately from the preparation in my Museum.*—In *The Dublin Medical Journal* for 1872 I published a remarkable case of “Enormous Inguinal Aneurism treated successfully by Ligature of the Iliac Artery high up, and accompanied by the most serious complications, cured by Operative Surgery.” I wish to draw attention to it now, because the man has

died, eight years after the operation, and I was so fortunate as to procure an examination of the body, and to note down all particulars of interest in this very remarkable case, and likewise was able to take away the entire vascular arrangement concerned—the heart, the aorta, the bifurcating iliacs, the common iliacs, the ligatured vessel, the aneurismal sac, the femoral artery on the right side as far as its entrance into the popliteal spaces, and on the left as far as the groin; and likewise to preserve the important anastomosing vessels on either side and the changes produced upon them on the right side by the cutting off of the main current of the limb, and to show how largely they increased, and secured by an abundant supply of blood the healthy life and nutrition of the limb operated upon. I may here mention that I should have much preferred to have inserted a pipe into the aorta, and injected a fine wax injection, coloured with vermilion, so as to fill the arterial system perfectly on both sides, and then displayed the vessels by a rapid dissection in their relative positions on either side, and then dried and varnished the preparation. The friends were so anxious about the man after death this could not be done; so I did the next best thing—I cut out carefully all the vessels, as I have described, and as seen in the beautiful preparation, which is carefully preserved. There were many points of the very deepest interest about this case, and a short abstract and history must be given here before the revelations of the *post mortem* examination.

The patient was very old, seventy-six years of age; the tumour was very large, filling up the entire inguinal region in the right thigh, and extending above Poupart's ligament. Twelve months before the operation he sustained an injury in the thigh "when unloading some stones from a cart;" one fell forcibly upon him, bruising the middle of the right thigh. The pain set in very acutely, so that he had to give up work for several days. At the end of the third month after the accident he perceived a beating tumour at the groin, but could not distinctly affirm that this part was not also injured when the stone fell upon him, the stone being of so large a size. Gradually and steadily the tumour began to enlarge. During the long period of nine months, from the first week of which the patient noticed the "jumping" of the tumour when only the size of a walnut, until the date he applied to me, when the tumour assumed the size of a large melon, he daily exerted himself in bodily labour, and in constantly carrying very heavy weights. In the Journal referred to, the position and size of the aneurismal tumour are accurately portrayed. The circumference of the limb at the most prominent part of the tumour measured nineteen inches, while that of the sound thigh at a corresponding point was only fourteen. On the 10th January, 1872, I tied the external iliac artery, and on February the 13th, when "dressing the wound, I made the slightest traction on the ligature, when it came away, thirty-five days after its application, and without a trace of

blood after it; dressed and supported the wound as before. The ligature had been well tied, and was perfect in its integrity, and holding the external coat of the artery in its loop." On the 28th March all the difficulties and dangers of the operation were overcome, the ligature safely away, the wound perfectly healed from its deepest part to the surface, the aneurismal tumour solidified, and undergoing rapid diminution by absorption. The patient could flex and extend both the leg and thigh without the slightest pain, the joints only being a little stiffened. The temperature and sensibility of the limb were at the same height and as perfect as in the sound one. The patient was still restricted to bed, the limb being supported on pillows, and rolled from the toes to the groin with a flannel bandage, gentle pressure being made over the tumour as it was passed upwards to encircle the abdomen and give support to its enfeebled wall on the right side. Up to this date everything had gone on well, and surgery had been triumphant in saving the man's life. Up to the middle of April (the 14th) he bore with steadiness the restrictions imposed upon him—confinement to bed, rest in the semi-horizontal position, and quietude of the limb. At this time the patient's whole condition was greatly improved; he was strong, put up a good deal of flesh, and was in excellent spirits. The aneurismal tumour had considerably diminished, and there was an entire absence of pain or uneasiness in the affected limb, and its temperature and sensibility were the same as in the sound one, and its motions of flexion and extension were quite perfect. On the 25th of April the patient began to complain of weight and uneasiness in the tumour, and on examination I perceived there was also an increase of temperature. Together with these changes there was considerable constitutional disturbance. He felt hot and burning the evening before, refused all food, and vomited frequently; he had no sleep. I was astonished at the suddenness of this change, and after some difficulty, owing to prevarication, made out the cause. For several days prior the man was in the habit, after I left the hospital, of getting on his clothes and walking about the garden for some hours together. He then admitted that after doing so, on the third day, he experienced an uncomfortable tightness in the limb. This sensation was relieved after going back to bed and taking rest. Every day that he went out, from this time up to the date of this invasion of fever, he suffered more or less in the tumour and the limb, and towards the end of this period, though he sometimes suffered acutely, yet he was afraid to complain, and was in the habit himself of adjusting the flannel bandage, and absolutely concealing the mischief which he had originated by his own indiscretion. The case now presented a most alarming aspect; rapidly the constitutional symptoms assumed the lowest type; the pulse was quick, 125, very feeble, and sometimes intermitting; the tongue was dry, brown, and hard; the eyes suffused, the features pinched and shrunken,

the skin dry and burning; the urine secreted in very small quantity, scanty, and high-coloured. The stomach was, after some time, quieted by repeated doses of hydrocyanic acid, with creasote and iced champagne, while the integument over this region was vesicated, the cuticle removed, and the raw surface sprinkled over with morphia. Brandy had to be given in large and repeated quantities to support and steady the heart's action, and strong beef-tea and chicken jelly for nourishment. The limb was evenly rolled in flannel as far as the knee, while all the swollen thigh was wrapped in flannels wrung out of hot opiate stupes, and enveloped in oiled silk; at the same time the limb was elevated to a considerable height, so as to favour the returning blood. By these means the burning tensive pain was partly lulled; opium had to be given in large doses, in conjunction with stimulants, every third hour, and so at least modified rest was procured. On the 3rd of May I found the constitutional symptoms were, in some respects, relieved, yet the local changes were far more alarming. The stomach had been quieted, light nourishment could be retained, and the abundant stimulants and opium taken sustained the pulse, and modified pain. On examination of the thigh it was fully twice the bulk of the sound one. The surface, particularly over the tumour, presented a purplish-reddish hue, and on pressure, which created intense pain, a kind of boggy, imperfect fluctuation was communicated to the hand. It was quite clear now what had taken place—acute inflammation of a diffuse character had been set up in the sac, with imperfect suppuration. I decided on freeing the fascia, opening the sac, and turning out the entire contents—ligatures, tenacula, broad-curved spatulæ, and knives being prepared, so as at once to arrest hæmorrhage, should it occur either by direct division of vessels during the operation, or from some vessel yielding a recurrent supply to the sac. An incision was made from about the centre of Poupart's ligament, extending downwards for about six inches over the most prominent part of the tumour, dividing the integuments, superficial and deep fascias. A director was passed for two inches lower down beneath the fascia lata, and a straight long bistoury was conveyed upon it, its edge then turned forwards, and the fascia divided by the withdrawal of the instrument, the integument not being cut. *I have frequently drawn attention to the advantages arising by this subcutaneous method of cutting short tensive inflammation of a fascia.* The knife was then carried through the anterior wall of the tumour to the same extent as the first incision, and immediately on its division a large quantity of grumous blood, broken-up lymph, and imperfect pus gushed out, following the track of the knife. I next, with my fingers, turned out a quantity of solid coagula, of lymph and blood, and dressed the exterior cavity with lint soaked in oil, having previously brushed the entire surface over with a strong solution of chloride of zinc (twenty grains to the ounce). It was as

fortunate occurrence that no arterial blood flowed after these extensive incisions and the manipulation required to clear out the part of offensive matters. At 3 p.m. the patient rallied well from the shock. May 25th—The wound is now healed, and bears being handled with impunity. He is able again to flex and extend the leg and thigh without uneasiness. The whole aspect of the man is changed in a most remarkable way. The anxious, haggard expression which he had on admission to hospital, and again when the diffuse inflammation attacked the thigh, is altogether gone. He has put up flesh in a rapid manner. The report goes on to state:—At this time I took an accurate cast of the abdomen and thighs down to the knees, and the drawing from it shows well the increased bulk of the limb, the position of the wounds, the one for ligaturing the artery and that for liberating the fascia of the thigh, and evacuating its disorganised contents. It contrasts well with the drawing beside it, copied with great accuracy from a cast which I took from the man before the operation. The knee is well delineated in all its aspects, and the emaciated condition of the limb speaks forcibly of his weakened state at this time (see Plate II., Figs. 1 and 2, in paper referred to). The frontispiece to the paper in the *Quarterly Journal* referred to has been beautifully lithographed by Mr. Forster, from a fine photograph taken by Lesage from the patient a month after he had been walking about quite well. I may here state, in continuation of the history of this case, that it may appear I have dwelt too much upon details, and so be tedious to some, but I cannot regret having done so. From the very first the aspect of the case was alarming, considering the advanced age of the man, his emaciated condition, the enormous size of the tumour, its extension above Poupart's ligament, and its almost entirely fluid contents. Again, it was essential to dwell upon the many changes made in the local management of this case immediately after the operation, during the long time of the detention of the ligature, and after the separation of the cord. So far may be considered as the first part of the case. Well, then, the secondary or after-part of the case surely affords one of the most instructive lessons in practical surgery, when, by the man's recklessness, his life was again imperilled, yet, by the boldness of the measures adopted, his life was secured, and his limb preserved in every respect as perfect as the other. Shortly after this the man left the hospital perfectly well, and resumed his former occupation as overseer to a large timber yard. The man, after this, often called to see me to show how well he was, and able to follow his work without interruption. At the latter end of January, 1880, he was suffering from a very severe acute attack of bronchitis, the violent and pressing symptoms were arrested, but on slight exposure he again got a relapse, and died March, 1880.

Post mortem examination eighteen hours after death.

Thorax.—The lower lobe of the left lung was greatly congested, and the pleural cavity contained a large quantity of fluid, slightly reddish; the lining membrane of the bronchial tubes was congested, with fine ramiform injection of the vessels throughout, and the tubes were choked up, filled with mucous secretion.

The right lung was intimately adherent to the chest wall, except in two places, where there were two considerable encysted pleural effusions; its lower lobe was also encysted, and the bronchial tubes throughout filled with mucus; the lining membrane of the tubes presented the same vermilion tint as that in the tubes of the left lung from minute ramiform arterial congestion.

The *pericardium* did not contain any unnatural fluid; a slight halitus moistened the opposing surfaces; nothing unnatural.

Heart.—On opening the heart the mitral valve was found slightly atheromatous, but quite competent to close the opening. The left ventricle was a little enlarged, and all three aortic valves were atheromatous and projecting from the wall of the artery, like stiffened long shelves. The aorta was atheromatous through its entire length (Fig. 1).

Abdomen.—There was no abnormal fluid in the abdomen. When cutting through the abdominal wall the deep epigastric artery was found more than three times its normal size, and also the internal mammary when anastomosing with it.

The viscera of the abdomen were healthy, except that the liver had undergone some fatty degeneration.

When removing the viscera the omentum and the cæcum were found united by bands—lymph bands of adhesion about two to three inches in length—to the internal line of the cicatrix, made for securing the main vessel. When dissecting off the peritoneum to remove the arteries the right ureter was intimately adherent to the internal and external iliac artery on the right side; at the same time its calibre was unconstricted and its functions not interfered with or interrupted by pressure. The external iliac artery was so firmly united to the iliac fascia that it had to be removed along with the vessel; the arteries on the right side were dissected out as far as the popliteal space. When the dissection was continued it was found that the external iliac artery on the right side was reduced to a fibrous cord through its entire length, as was also the common femoral as far as the sac. The superficial femoral started as a cord from the distal extremity of a mass of cicatricial tissue, which represented the sac that had to be laid open and its entire contents turned out, and was impervious as far as the opening in the adductor magnus to the popliteal space. The profunda femoris which was given off from the posterior surface of the sac was obliterated for about an inch and a half, and then all the branches from it were considerably dilated by anastomosing currents. The right internal iliac artery was much larger than the external iliac

of the opposite side, and its four branches, which leave the pelvis as seen in the preparation, were more than three times their normal size. *The veins, the femoral and profunda, lay behind the aneurism, and were quite pervious, contrary to the opinions expressed in some of the class-books of the day,* and to the fact of their returning the blood freely from the limb I impute much of the success of the operation and the safety of the limb from gangrene. From the facts which I have detailed, from an examination of this beautiful specimen in my possession, and represented here though feebly, it will at once be conceded and understood how that from the enlarged and numerous anastomosing vessels and full supply of blood the limb was well nourished and restored to all its functions.

CASE II.—*Depressed part of Frontal Bone from gunshot wound; considerable deposits behind occurring some time after the accident, producing pressure on the Brain; Fits and Madness; Operation of Trephining perfectly successful in removing all symptoms; Recovery.*—Mr. D. B., aged twenty-one. In December, 1867, I was consulted about the following very remarkable case. Two years before this time the young man shot himself in the forehead in the following way: Some young friends of his were jeering him in a back yard as he stood at a window looking out. He raised up the window—his object being to frighten them by firing a pistol at them loaded with powder and hard wadding—but could not force up the sash sufficiently to let out his body. In forcing out his right shoulder and bent arm, unfortunately the pistol went off, and the contents hit himself in the centre of the forehead about an inch and three-quarters above the nasal process of the frontal bone. The young fellow was stunned, fell back and bled very profusely from a large lacerated wound. He recovered consciousness in five to eight minutes, and after this was put to bed and regularly treated for six weeks. The accident occurred in England, and his treatment during the time was conducted there too. During this time the wound suppurated freely, and several small pieces of bone became detached and were extracted from it. Eventually at the end of three months the wound was entirely healed, and the young man went about without the least uneasiness, loss of memory, or suffering of any kind.

Six months after the receipt of the accident symptoms of irritation of the brain began to show and develop themselves—first by peevishness, whereas in all his early life and heretofore his temper was most gentle and loving, so that he was the beloved child of his mother amongst several. He dwelt constantly on the disfigurement occasioned by the accident. As time passed on his irritable symptoms became greatly aggravated, and he seemed to be attracted, affected, and greatly irritated by all kinds of trifling matters. He became gradually more silly, and would pick up useless things from the ground and again cast them away,

and so repeat this act over and over again without hesitation; if checked in doing so he would struggle with violence to gain his aim, and then would fling away the useless trophy. Soon after this all his movements would be studied with the greatest carefulness, so as to make no noise, and all the time moving on his tiptoes, but this act was often attended with a jerking motion that appeared quite involuntary, and so, too, he would sometimes violently jerk his arms backwards and forwards. Nine months after the accident he was placed under control in this country, and when only four days from his admission he was seized with hysterical fits and violent crying, ending in falling down and becoming violently agitated, this state subsiding into perfect insensibility. After being roused and recovering, and being lifted up, he would be partially rigid, and if placed recumbent would rest upon his occiput and heels. He frequently got these fits even ten times a day sixteen months after the accident, and after his being under the most judicious care and control in this country.

I saw the patient for the first time in December, 1867, and after hearing his previous history, such as I have related it, I examined with the greatest care the seat of injury—his forehead. The centre of the frontal bone and two-thirds above it were considerably depressed somewhat more than three-quarters of an inch—the integuments covering it being corrugated and irregular from the lacerations inflicted at the time of the accident and from irregularity in the cicatrization of the part as it passed on to repair. On making pressure on the most depressed part the patient winced, and on deeper pressure being exerted he quickly drew away his head. He could speak but in monosyllables. He could hold no conversation; he seemed half silly and foolish, and, as I was informed, he got some eight or ten short fits every day. His pupils were dilated, and he complained of constant uneasiness in the forehead. I put him under small doses of mercury and James' powder, prolonged to gentle salivation, and kept it up steadily for six weeks, and it was curious, showing the power of treatment by mercury. The fits all ceased, and he was going on well. At this time I came to the fixed conclusion the pressure was producing its serious consequences on the brain, and as a primary proceeding tried the effects of mercury, with the expressed determination to lift up or take away the depressed frontal bone, if the constitutional treatment was not permanently successful. I did not see the patient for some months after, and then I urged the necessity of trephining the skull. I then met in consultation in the case the late Sir Dominic Corrigan. After considering every feature of the case he agreed with me that the operation was urgently called for. Circumstances interfered with the friends carrying out our suggestion until January 30, 1868. His condition now was considerably worse; he had repeated fits, and pressure on the depressed part caused more marked

suffering. On pressing the centre of the depressed bone he would rapidly reeede from it, and pressure, if continued, would render him partially insensible. In other respects the young man looked well and in good health, being well nourished from the tender care with which he had been watched by the gentleman to whom his life was entrusted.

On the 30th January, 1868—assisted by Sir Dominic Corrigan, Dr. William Colles, Professor Bevan, and Dr. Lynch—I proceeded to operate. The patient was placed on a high table with a firm mattress on it, and a few hard hair pillows under his head, so as to resist pressure and render it fixed, firm, and steady. A strong light fell upon the forehead, so as to reveal clearly each step in the progress of the operation.

The patient, having some time before taken a little brandy and water, was now placed under the influence of chloroform. In a short time its anæsthetic effects were most gently produced, without the least spasm or struggling or excitement. Standing on the right side of the patient, close up to his head, I made a vertical incision from close to the hair down to about half an inch above the nose, and a second at right angles with it to the same extent, fully three inches; the lines crossed at the most marked portion of the depression at its most tender and sensitive part. The flaps were then rapidly dissected up, though the tissues were all condensed and fibrous, and absolutely the knife grated and its edge was turned as it passed beneath the angles of each flap. Each flap was dissected carefully up to its base down to the periosteum. One large vessel sprung in the angle at the right side; this I ligatured, as the artery was of such capacity as to throw out blood in sufficient quantity to conceal the further steps of the operation. Though large these flaps, yet I had to carry the vertical incision higher, and to dissect up further the corresponding flaps. On this being accomplished, we had fairly revealed a portion of the frontal bone corresponding to the seat of injury as large as a five-shilling piece. I then scraped away the periosteum from the immediate part surrounding the outside of the depressed part. This left a portion to be removed with the trephine nearly as large as a two-shilling piece—this representing as nearly as possible the size of the crown of the trephine, a very large size, and one that I had made for the operation. I may here mention that I had two crowns made exactly the same size, so that if the teeth of one should be twisted or broken, as I have often seen occur, the second crown could be applied and the operation completed; and this hint I give and would enforce upon all operators, as the fact was demonstrated in this very case. The instrument being prepared with its pin fixed well down, close to, a little above the centre of the most depressed part, it was rotated and made to work, lightly at first, until the saw took its grip and bit well, and was well stricken, fitted in the cut groove, after which the pin was withdrawn, the saw brushed and the channel cleared. Again the instrument

was applied, and with weight and steadily, for the bone was as hard as ivory. Again the saw was cleared, the curve cleansed and measured in depth, which was nearly half an inch all round. The instrument was blunted and spoiled, and its teeth forced out of their direct range. I changed the crown of the instrument for a fresh one. The instrument was now applied again, and with a lighter hand, and with greater care and watchfulness against any undue pressure; yet still it worked steadily through dense bone for some time. Now again it was removed from the sulcus, the depth of which was traced round by a cut quill; in depth all round it measured fully three-quarters of an inch. With the greatest carefulness I now introduced the saw, and made it revolve in light half turns with the slightest pressure, yet rapidly, so that it should cut with evenness and decision. I tried now the elevator and strong forceps to lift the piece from its bed, but yet it remained immovable and fixed. A few turns more of the trephine completed its detachment, and the isolated piece was lifted with the greatest gentleness from its bed; it came away from the dura mater without hesitation, and therefore uncompromised by any adhesion. There was no weeping of blood, and therefore the dura mater was quite visible, unruffled on its surface, and perfectly adherent all round the cut margin from where the bone was taken away. On the bone being lifted and pressure removed the brain rose up to more than half an inch. The chloroform acted perfectly up to this time, and the young man was nearly quite sensible. On the most careful examination of the aperture and parts around, it was agreed to by Sir Dominic Corrigan and those assisting that nothing more was required to be done, as all the depressed part was included in that removed by the crown of the large trephine. No portion beyond that taken away seemed to encroach upon the dome of the cerebral cavity or make pressure on its contained life-giving structures. So, after sponging gently the parts around, the flaps were laid down and each gently sustained by a strap of adhesive plaster, the apices of the flaps not being drawn closely together or confined, in order that all weeping or exudation from the cavity behind might have a ready escape. A couple of folds of lint, soaked in oil, was laid lightly over the aperture, wounds, and dressing to supply moisture, exclude air, and retained in position by a few adhesive straps, avoiding all pressure.

The patient was now quite free from under the influence of chloroform, quite conscious, and not suffering pain. He answered quite rationally a few questions. Ordered mucilaginous drinks acidulated, and a mild sedative at night; heat to his feet.

Portion of Bone removed.—The piece of bone removed by the large trephine was the size mentioned—that of a two-shilling piece. On examination of the specimen it was quite clear that the internal table at the time of the accident was driven back fully half an inch, that the

outer table with all external to it was broken up in fragments, many of which, as already stated, were extracted at the time, while many pieces came away in the discharge during the suppurating process. In addition to the depressed bone, the thickness here towards the centre was considerably augmented by the deposition of new bone, making the thickness in all fully three-quarters of an inch; from this central most depressed and thickened part the bone surface gradually fined off to the circumference, so that a little outside the sulcus cut by the trephine it gradually fined away, and there was very little appreciable encroachment on the dome at all. The piece of bone removed was remarkable in many ways. On section it was as hard as ivory in the centre, with close compact bone structure all around. The preparation is in my museum, and presents numerous features of the deepest interest.

January 31st, 10 a.m.—On going into the patient's room I was singularly startled and astonished by his occupation. As he lay in bed, gently reclining on his left side, he was turning over the pages of a picture book, and examining each most inquisitively. I was told by his careful and intelligent attendant, who had been minding the patient ever since he came to Ireland, that he was quite amazed at the questions put by the patient during the night; that he spoke quite rationally, and asked for the urinal, and for drink when he felt thirsty—things that he never did before. On the shutters being opened in the morning, and light let into the room, the patient saw the book on the table, and asked for it. He opened it himself, began to examine the pictures, and even praised them. As long as he had been under care he never noticed books or ornaments, or anything of the kind, but was stolid, silent, and gloomy. On speaking to the young gentleman he answered me quite rationally, and every question without the least hesitation; he put out his tongue the moment I asked him, and this he never could be got to understand or do before the operation. When at a previous time I wished to see it, it was accomplished only by force. He expressed himself as being quite free from pain. Certainly I was remarkably struck with the little amount of fever or excitement produced by the operation. He slept well, particularly the afterpart of the night. The skin was soft and natural, his pulse only 92; tongue moist, eyes not suffused, no tension or pain about the wound, and no inflammatory discoloration. Ordered beef-tea and bread freely, cooling acidulated drinks, a hot jar constantly to his feet.

February 1st.—He slept well; pulse, 88; skin cool; quite rational; answers all questions; reason perfectly restored. Dressed the wound; watery discharge oozing out; edges of flaps outside their angles all united; free escape towards their apices for all exudations to flow off; parts gently supported with adhesive straps and a few folds of oiled lint; beef-tea and acidulated drinks freely.

February 2nd, 11 a.m.—Slept well, and is quite composed; speaks

quite rationally, and remembers and talks of occurrences of yesterday; tongue clean; pulse, 94; skin soft; wound looks well, discharging imperfect pus, free from pain. Readjusted straps and lint soaked in oil; diet as on yesterday; hot jars always kept to feet to act as a derivative; urine passed freely, and bowels gently moved.

February 3rd, 10 a.m.—A little restless in the night, but perfectly conscious, and asks distinctly for all he requires; wound looks very well. Dressed simply; ordered Battley's sedative, chloroform and spiritus ætheris nitrosi—a few doses to give calm and rest; beef-tea for nourishment.

February 4th, 4 p.m.—Had a quiet night, and slept well, and at intervals through the day. Ordered draught as before at bedtime; wound looks admirably, pulse quiet.

February 5th.—Doing favourably in every way.

February 6th.—No change; far more rational, and asks for everything he wishes for or requires.

February 9th.—Going on most favourably in every way; wound filling up and healing without a bad symptom.

February 11th.—Going on well in every respect; quite sensible on the minutest matters, and now begins to talk about home and going there.

February 15th.—The wound healing up most rapidly by granulation. Now the repair was being so rapid that I thought it would be well and safe to apply a blister to the nape of the neck, and keep it open with d'Albeyspeyre's plaster; also ordered four grains of Plummer's pill at bedtime and in the morning.

March 20th.—All healed, but very slight depression just where the flaps sank into the great aperture a little. Not a bad symptom of any kind. Stopped pills, and treated the discharging blister at nape of the neck. Mental capacity greatly improved. Allowed to get up and move gently about the room. It was most remarkable how competent he was to do this after so long and severe a confinement. At this time the results from the operation were splendid. After this he steadily improved both bodily and mentally; he was able to take walking and carriage exercise with great pleasure, and to enter rationally into all amusements with feelings of satisfaction. The changes effected in this case by a bold and judiciously applied surgical operation can never be fully enough appreciated. This fine young man, subjected to violent accident, his skull broken in, total unconsciousness, yet by surgical interference restored to reason; again, after months, secondary mischief, further encroachment and pressure on the brain; interference with its functions; repeated fits, eight and ten in the day; imbecility—imbecility to such an extent that even the warnings of the requirements of nature were unheeded; all interest in objects around dead within him; even food he would not take except by force; and now the marvellous change manifest after lifting up the depressed bone and superadded layers making pressure on

the brain; the quiet repose of the patient during the night after the operation; his consciousness perfectly restored in the morning; his minute and searching examination of books at this time, that he never minded, that lay unheeded for many, many months before; his speaking quite sensibly to his attendant; and all these changes wrought, brought about in a few hours after the operation; his gradual and steady amendment up to the healing of the wound; the strengthened memory and power of will day after day becoming more firmly established, until reason ultimately entirely regained and usurped its sway. In a short time after the young gentleman was removed to England, and when I last heard about him, several years afterwards, he was quite well, never had a recurrence of a fit, and was enjoying himself in all the healthy recreations of life.

CASE III.—*Depressed Fracture at the lower angle of the Parietal Bone and squamous portion of the Temporal, caused by the kick of a horse; fits, inability to do any work; the seat of injury trephined, and the result perfect recovery; the man has been working steadily with his employer for years and no inconvenience of any kind since the operation.*—Before passing from the subject of trephining the skull for destructive effects resulting after injury—inflicted, it may be, at a time very remote, or even more recently after accident—I shall narrate one case which occurred shortly after that which I have described, the patient being admitted under my care. D. E., aged thirty-six, was admitted to Sir Patrick Dun's Hospital early in June, 1868, by a letter from a most influential country gentleman. The young man was tall, of powerful build, and always actively employed in the management of a large stud of horses, and most reliable in every way. Two years and a half before his admission, following most carefully his occupation of grooming and watching his horses (hunters particularly), there was one horse so very unmanageable and capricious in temper that no one would dare to approach or clean him up except E. On the date mentioned, E. was cleaning the horse, when he most viciously and suddenly kicked at him when rubbing down one of his hind legs, striking him in the lower part of the left parietal bone where it joins with the squamous portion of the temporal. The man was knocked perfectly insensible, and remained so for a few minutes, after which he recovered consciousness. There was a marked indentation in the part stricken, caused by the cock of the shoe. He was attended after this most assiduously, and all the serious symptoms passed away. He was confined for several weeks to the most rigorous management, and by it the active inflammation at this time was ably met and combated. Time passed on; the man resumed his duties as head-groom. His favourite horses he would look after and manage and even clean himself. He acted in this pleasing way to him for some

time, and continued his usual exercises. After about three months employment in this way, he began to feel uncomfortable after stooping even for a short time. By careful watching and having his work done these troublesome symptoms of fulness of his head and unsteadiness passed away. There was during a long time of two years and a half the terrible apprehension of dying suddenly hanging over the man. He had to husband his strength most vigilantly. No stooping or excitement. This he carried out, by the advice which he had obtained, most carefully. However, four months before he came under my care, in trying to brush down the legs of a horse, he fell in a fit, and remained working in it for a considerable time. He after this exercised the greatest caution in stooping; and as long as he did not over-exert himself or stoop, the day passed without a fit. This state continued for more than a week. On the man resuming his business, and stooping to carry out what was required, the fits came on, and then for several days he was attacked two and three and four times, and remained half insensible afterwards for an hour or an hour and a half. There was a repetition of this condition for several days, when his master sent him up to Dublin. I admitted him to Sir Patrick Dun's Hospital at once. Having got from himself, quietly and steadily, the report of his ease, as I have just detailed it, I was saddened at seeing so fine and so powerfully-framed a young man, and hearing his own dismal and gloomy story of his state. When those fits, which recently had attacked him on the slightest effort to strive and make exertion, came on he suddenly became confused and lost all consciousness. On carefully examining the stricken part, just above the left temple, it was quite palpable that about two inches or two inches and a half above the left zygoma, a little above the curved margin of the squamous portion of the temporal bone, there was a well-marked depression—that is, in the lower margin of the parietal bone. When running to its inferior anterior angle the finger pressed upon the deepest part produced uneasiness, and if with still greater force, absolute pain—the patient wincing from the pressure, and, if continued, moving his head away. Now, as I have mentioned, two years and a half had passed by since the reception of the accident—though the man recovered from the primary injury, yet, after some time, uneasiness, giddiness, loss of consciousness, gradually crept on, ending in fits, at first one or two in the day, but afterwards amounting to several in the twenty-four hours, and even increased in frequency up to the date of his admission—I determined on trephining this man, and lifting up the bone where depressed. On June 11th, 1868, I performed the operation in the theatre of the hospital before a large number of surgeons and students. The left side of the head being shaved, the patient was laid upon the operating table, his head being firmly supported on two hard hair-covered chair seats, so that the head could not sink or

yield when the requisite pressure and force were applied over the injured part so as to cut out the depressed part. The patient being placed fully under the influence of ether, he was turned on the right side, the head being grasped by an assistant, and so steadied on the solid support beneath. I then made a horizontal incision about three inches long, the centre of it bearing immediately over the most depressed part; two arteries, very large, sprung, but were immediately secured by ligature. I then made a vertical incision about two and a half inches long, crossing the horizontal one in its centre; two thirds of this incision were above the horizontal cut, the lower part not coming down to within an inch of the zygoma. I dissected rapidly up the flaps from their apices to their bases, laying bare the entire depressed part. The integuments were greatly thickened, and, when lifted up, revealed the depressed bone far deeper than was anticipated from earlier examination. I then proceeded to fix the trephine (a large one) by its central pin, and that placed in the very middle of the depression. The bone was very hard here, yet the pin took its hold, and then I steadily worked it all around, and, having made a sufficiently large sulcus to hold the teeth of the instrument, I withdrew the pin, brushed the instrument, and cleaned the track through which it had travelled. Again the instrument was applied for some five or six turns, and the minute examination of the depth cut through, by a piece of quill cut like a toothpick, it being obvious that great caution should be exerted here, as I have often seen the parietal bone very thin in this region, where it joins the squamous portion of the temporal. After a few more turns of the instrument the bone was free below, but very gentle half-turns of the instrument on the undivided part soon cut it through, and the piece was easily lifted out. The depressed part was quite convex, and measured three quarters of an inch. On taking it away the brain could be seen sunken down considerably. On watching it for three minutes it rose up to the level of the aperture; there was no bleeding. The man now recovered from the ether, and was quite conscious. I brought gently the flaps over the wound, and laid a compress, steadied over all by a few turns of a bandage. He was then carried on a stretcher to his bed, and placed there with hot jars to his feet and sides. On examining the piece of bone removed it was clear upon section that the bone had been broken in pieces by the cock of the horse's shoe, the internal table being broken up and forced in. After this, lymph secretions, terminating in cartilaginous deposits, were superadded, and gradually converted into bone. An encroaching on the brain structure produced pressure slowly at first, ushered in by an occasional fit, and, as matters progressed, by a marked increase in the number of them, and finally by interfering with the man's mental capacity altogether. Nothing could be more satisfactory than the results of the operation so far. At 4 o'clock, p.m., I called to see

him, and found him quite sensible and cheerful, he had had a short and refreshing sleep and had taken some chicken broth. At 9 p.m. saw him again; no fit or uneasiness of any kind throughout the day.

June 12th, 9 a.m.—When I arrived at the hospital this morning I was greatly saddened when I heard the man had a fit at 6, and another at 8 o'clock. I was much surprised and gratified when I found out the cause. The small and thickened compress which I placed over the aperture was pressed deeply into the trephine hole from the man's restlessness and turning on his side in sleep; it was pressed in deeply just as much as the piece of bone which had been taken away, and exerted as much pressure from being lain upon; it was driven in, and became dry and hard. After removing this foreign body from the part, the brain rose up again, and perfect consciousness was restored. The flaps were now evenly adjusted, and after this rapidly healed. He gradually grew stronger, he recovered from this without a bad symptom, and no return of fits, so that the pressure exerted on the brain by the hardened compress verified, in a most remarkable way, by its progression and attendant fits, how the thickened bone acted, and was the cause of all the mischief. The man was dismissed cured in five weeks, and returned to the country quite well. In three months after he left the hospital, he called on me and stated from the time he left he returned to his service, and ever since was actively employed about his horses. It gave him no inconvenience to work hard, and he could stoop and do the most violent work without headache or giddiness, and he never had a return of the fits. The man certainly looked the picture of health. Writing now, some years after the operation, I may state not many months ago I heard about this man, and he still remains in perfect health, never having suffered fits or any inconvenience since the operation.

I could state many other cases of injury inflicted on the skull bearing on the propriety of interference by surgical measures, and in which I have been an active agent, but shall content myself by the publication of these two very remarkable instances, not only carried out to the letter of practical surgery, but also carrying with them a great weight *practically suggestive*.

CASE IV.—*Suicidal Wound of Throat, implicating the Trunk of the Common Carotid; Successfully Ligatured above and below the Wound; Perfect Recovery.*—On the morning of April 6th, 1878, when driving home through Fitzwilliam-place, a gentleman ran up to my carriage, and stated in the greatest alarm that a man had cut his throat just close by in the stable-lane running behind the southern houses in Fitzwilliam-square. I at once jumped out, and brought my box of instruments with me, the gentleman accompanying me. We ran together down the lane,

and in the stable-yard corresponding to the second or third house a large number of gentlemen and people were collected. The man had his coat and waistcoat off, and his shirt thrown widely open; he lay extended on the stones, his head being supported by the distinguished physician, Dr. Head, who, living within a few doors of the place, was at once brought over, and saw him. A few moments only had elapsed, when I chanced to be passing, and was called in the manner I have described. Dr. Head at once said to me, "I am afraid he is dead, he has no heart-beat, and I cannot feel his pulse." [I think it right to mention here that I have Dr. Head's permission to mention this fact—his opinion—a most important statement.] The man lay in a large pool of blood, which had flowed from an extensive wound in the lower part of the left side of his neck. I opened my box, and quickly took out knife, forceps, tenaculum, and ligatures. As I watched him very carefully, I perceived the slightest beat, or rather thrill, in the right side of the neck. I at once cleared out the wound, about two inches long, and very deep. From the bottom of this there came up a very feeble wave, or rather weeping, of blood. I enlarged the wound upwards fully three-quarters of an inch, and that deeply, to get at the source from which the blood so feebly welled. On doing so with much care, I discovered the point from which the blood came. I believed the vessel to have been the common carotid, and the outside of its wall was nicked and lacerated by the blunt knife that the man thrust into his neck. The wound was a small one, and its edges lacerated, and so the blood flowed slowly but steadily to almost draining the last drops. I seized the trunk of the artery, and freed it all round by a very few touches both above and below; then the vessel was seized below the wound; first, Dr. Head held the forceps, and I passed a ligature around, and tied it firmly, and then in a similar manner tied the carotid above the wound. After this not one drop drained into the wound. Dr. Head and myself then forced some whisky and water down the man's throat, and into his stomach, and then through an œsophageal tube. We wrapped him up in blankets, hot bottles, and plenty of horse clothing. We continued rapidly to throw stimulants into his stomach, and frictions with whisky and turpentine over his head and chest, at the same time warm clothing being kept wrapped around him. In about a quarter of an hour the heart-beat became slightly perceptible, and after some minutes later the slightest trickle through the radial artery. Soon his eyelids began to quiver, and shortly after he feebly opened his eyes. There was not the slightest trace of blood from the wound. Thus covered up in as much warmth as could be procured, I had him placed on a police stretcher, and brought along the canal, my hand resting all the time upon his wrist, to the City of Dublin Hospital, the nearest one to me, and where I knew I could at once procure a bed from the distinguished surgeon, Mr. Wheeler, and also procure his able

assistance towards resuscitating, and, if possible, saving this wretched man's life. I availed myself of the near position of this hospital as tending to the man's safety, rather than have him conveyed down to my own wards in Sir Patrick Dun's hospital, considerably further away. Immediate action here was everything, and for the preservation of his life everything else should give way. Even when bringing the poor fellow along the canal, we had to force down whisky and water into his stomach several times to revive and keep up the heart's action. On bringing the man to the City of Dublin Hospital, Mr. Wheeler was there, and at once placed a bed at my service for the patient. His name was Patrick C., aged thirty-six years. Every appliance that I could desire, or that was requisite, was at hand—a heated bed, hot jars, &c. On telling Mr. Wheeler the serious nature of the case, its urgency, how that the man was pronounced dead, then showing him the terrible wound in the neck, the severe and difficult operation that I had performed upon him, securing the carotid trunk in the neck above and below the wound that had been inflicted, and how that it had never yielded a drop of blood after, he most thoroughly entered into my views as to the course to be adopted and followed out, so as effectually to resuscitate the man. His state at this time even was very uncertain and bad. No doubt the terrible danger that hung over the man—a repetition of bleeding—was entirely averted, yet from the nervous shock and loss of blood it required the nicest management to restore and bring life about again. Surgeon Wheeler and myself went heartily to our task. We had his chest rubbed rapidly and steadily with stimulants; beef-tea and brandy injected into his stomach, as he felt disinclined to swallow; brandy and beef-tea, with ether, were thrown up the rectum; hot jars along his sides, limbs, and abdomen. For fully four hours Surgeon Wheeler and myself, with many pupils, worked at the case, when we got the heart to beat steadily, and his pulse to give evidence that its action would be maintained. After about five hours' work at him, we considered he had rallied wonderfully, at the same time that he should be watched by relays of assistants. Lest hæmorrhage should occur from the wound, its edges were drawn gently together by a few straps of adhesive plaster, and the ligatures carefully protected. At night reaction was fully established; wound quite right.

Now that the man is in comparative safety, I shall detail, as told to me, how his life was brought into peril. The coachman and this groom had on many occasions quarrelled; jealousy had crept in as the beginning of the trouble; both men, after some time, became rife for mischief, and this sullenness and bad temper at last culminated and settled into a terrible fight. The coachman took a stable fork and struck the stableman violently with it, and swore he would stab him, when instantly the stableman, a very powerful man, seized a wooden cross-

bar of a door, and knocked the coachman insensible; he thought that he had killed him. He then, in his fright and frenzy, thrust a large blunt-bladed pocket knife into the left side of his neck low down, inflicting the wound which I have described as so nearly terminating his existence. He rushed along into the stable-yard and there fell, exhausted from the large loss of blood; he remembered no more afterwards. The noise was heard in the lane, the gate burst open, and the public rushed in, forming the large meeting I have described. From the date of his admission to the City of Dublin Hospital he went on steadily, owing to the clever and assiduous attention bestowed upon him by Surgeon Wheeler and myself. For many days he had to be most vigilantly watched, lest hæmorrhage might again burst out from the neck. An ample supply of nutriment was given by the mouth, as well as beef-tea enemata, with brandy, by the rectum. The wound speedily healed; not one drop of blood escaped after I securely ligatured the large vessel above and below the wound inflicted on its side. The watchfulness over the man for many days was such as I have described in my work on "Operative Surgery," when dwelling on suicidal wounds in the throat, and I shall just briefly relate one or two instances here as being so pertinent to the subject, but, before doing so, would transcribe from my work the few following sentences:—When hæmorrhage takes place from arteries divided in the neck, it is always rapid, profuse, and generally continuous to syncope, and often unto death. Should the carotids escape, the fact still maintains, owing to close proximity of the wounded vessel to the parent trunk. Such a condition precludes the attempt at a natural hæmostatic being formed; no coagulum can block the artery, no exuded fibrin can remain for a moment, the column of blood forced from the heart washes away every obstacle in its course, and it is only when the propelling power is enfeebled, diminished, almost lost, that the bleeding, even for a few moments, is stayed. At this period the surgeon arrives, and how is he to act? Upon his decision now will very often rest the issue of life or death. Search should at once be made for the wounded artery; not for a moment should the patient be lost sight of; every requisition must be had recourse to—the internal administration of stimulants, the repeated application of warm sponges to the wound—until by a fresh flow of blood the source of its origin becomes obvious. Should either of the main trunks be wounded, the artery should be ligatured above and below the wound; if large collateral branches be cut, the same rule should be followed, *if practicable*. I have marked the words "if practicable" in Italics, because sometimes the best efforts of the surgeon will be frustrated in endeavouring to secure the vessel at the wounded part. In such a dilemma he should at once proceed to the common carotid; and the records of surgery, dispassionately viewed, irrespective of theory, will warrant him in the propriety of the practice, and cheer

him with the most sanguine expectations of success. At p. 375 in my work on "Operative and Conservative Surgery," it is further stated:—"There are certain cases where, for instance, the bleeding vessels can be seen and ligatured or checked by the approximation of surfaces with the twisted suture; and when, at the same time, a large trunk is supposed to be injured, and has ceased to give blood, it is better to wait and not at once to operate upon it, for the immediate risk from further loss is, to a *certainly*, checked by the surgical means employed, and the remaining wound can be vigilantly watched and subjected to treatment according to circumstances."

The following case, taken from my work on "Operative Surgery," will illustrate my meaning, and is full of interest:—

"J. W., aged twenty-nine years, a young man, was admitted to hospital under my care, October 28, 1863, at half-past eleven o'clock at night, bleeding furiously. The injury was inflicted in the following way:—The patient and a comrade went out together to spend the day; some altercation arose, former disputes embroiled the matter, and finally a personal struggle and a boxing-match, in which the latter was defeated and severely punished. They shortly after separated, but revenge was not to be subdued or lulled to quiet. The beaten man hurried off to the home of an acquaintance—a fellow-tradesman, a shoemaker—and secretly abstracted from his tool-box a long narrow-bladed knife. Armed in this way he quickly followed upon the steps of his adversary, and tracked him to his home. He knocked at the door rather impetuously, when it was opened by his companion of the morning; and, without a word, he struck him with the knife in the face, laying open the under-lip to the chin; next he thrust the knife through this gap, severing the right cheek, to a great extent, from the lower jaw, and dividing the facial artery. The injured man was so taken by surprise, from the suddenness of the attack, that before he could recover himself he was again violently stabbed in the neck. From this the blood rushed out, and so alarmed was the patient that he grasped the wound and side of the neck, and violently pulled and wrenched it. He never let go his grip, so conscious was he of this dangerous wound. He loudly screamed for help. He was soon assisted, and, in a faint and dying state, was rapidly brought in a cab to hospital. Fortunately for him he had not more than a few hundred yards to travel. I was sent for, and saw him immediately after his admission. He lay almost still and motionless, stretched upon a bed, with the apothecary and resident student endeavouring to control the wounded vessels in the lip and cheek, from which, even in spite of all their efforts, some blood still appeared. The source from which the blood was coming most freely—and it was

welling out of the mouth—was the facial artery on the right side, just as it rose above the jaw, in front of the masseter muscles; it was cut from the inside. It was evident, after the lower lip was slit down by a gash, the knife was moved about, accounting for the irregularity of its division, and then thrust between the cheek and bone, towards the right side, severing the cheek from the maxilla and dividing the artery. Besides this, by the vertical incision vessels of considerable magnitude were implicated, and threw out their blood rapidly from the opposite side. The flow from these vessels was partially controlled by the pressure of the assistants. It was at once apparent how great was the quantity of blood lost, for all his clothes were absolutely saturated with it, and the pallid, almost pulseless, condition of the man—for only the feeblest thrill could be discovered in the artery at the wrist—confirmed the impression that he was about to perish from hæmorrhage. The wound in the neck, though not bleeding, yet was conspicuous from its dangerous locality and the swelling around it. To these particulars I shall more earnestly advert just now. The source of bleeding which first demanded attention was the facial artery. I secured it from within, carrying a ligature around each cut end of it with a curved needle fixed in a handle; the ends were tied and all bleeding was arrested from this locality. I next brought the edges of the wound in the lip evenly together, though irregular and jagged as they were, and maintained them so by several points of the twisted suture, the needles being passed close to the mucous membrane. Thus all hæmorrhage was checked. During these proceedings brandy had to be frequently poured down the man's throat, and with much difficulty at first he was got to swallow; a quantity of it with warm water was also thrown up by the long tube into the large intestines. Its stimulating effects were shortly manifest in his being slowly and gradually returned to consciousness, any further loss of blood being entirely checked. And now as to the wound in the neck. It was not more than three-quarters of an inch in extent, situated in the left side, nearly an inch below the angle of the jaw, and lay directly across the carotid trunk, a little below its bifurcation. The wound was lifted up by an oblong swelling, fully the size of a large walnut, its long axis in the direction of the carotid, and from this wound trickled, ever so tardily, a thin stream of watery blood. I never meddled with this wound; its edges were left apart; there was no pressure put upon it, so as to guard against any deeper bleeding. There was no heave communicated either to the current or the tumour, for as yet the heart's power was not revived, its impulse not restored. The fluid that escaped told its own story; it was the strained blood—that coming in with the last ebb of life. An assistant was left beside the man to watch this wound in particular, and to order, according to directions, the sustenance for his gradual revival.

"The assistant was left to watch the wound, with directions carefully to mark the rising of the heart's action, the force of the pulse, and, on the appearance of red-coloured blood escaping, to place *his finger in the wound*, and so check its flow until I was sent for and arrived. I was very particular in enforcing these directions, for I had no doubt whatever that the carotid was wounded. The wound was small, but the knife was long, narrow-bladed (a worn knife), sharp at the point. It struck immediately over the artery, deep into the neck; on its withdrawal, blood gushed from the wound. The wound was seized, bruised, pulled about with violence, and held so for some minutes, while the man became faint with the rapid loss from other sources. Such a sequence aided the suppression of a further flow from so large a vessel, in conjunction with the torsion and bruising exercised upon it by the determination of the patient. The swelling deep in the neck followed almost instantaneously on the removal of the knife, both in its track and beyond it too. Instruments were all ready to secure the artery above and below the wound on the first recurrence of bleeding.

"October 29th, 9 a.m.—The patient has been quiet; pulse very feeble, yet regular; no return of bleeding; serous weeping from the wound in the neck. The patient lies still, motionless, tallow-coloured, with a vacant stare; no expression, no life about him. A favourable heat was developed over his body, and he was perfectly conscious of everything passing around. Ordered sips occasionally of cold beef-tea; and, now that the heart's action was restored sufficiently to sustain life, I considered it judicious neither to increase by food or stimulants the current from it, lest it should be sufficient to overcome the retraction and contraction of the wounded vessel, or wash away the coagulum or reparative material thrown out for its temporary check or final closure. Still the vigilant assistant kept his watch.

"30th.—To-day the tumour has certainly increased in size; there is a distinct heave in it, a general equable enlargement on close observation, though no distinct bruit could be detected with the stethoscope. The head was well supported, bent forward on the chest, so as to lessen the force of the column of blood sent upwards from the heart. Ice was applied to the tumour, and kept day and night to it; and now, also, opium was freely administered to allay an unaccountable restlessness and anxiety which settled on the man. Were it accompanied by acceleration and throbbing of even the feeble circulation which was developed, I would have anticipated it as the precursor of secondary hæmorrhage, but the attendant circumstances would not warrant such a conclusion. Without any remarkable phenomena the needles were removed, the stitches taken away, and the wounds in the face all healed. The tumour in the neck slowly increased up to the 12th of November, when suddenly its pulsation ceased, and gradually it began and continued to diminish

until the 20th, when it remained as a hard elongated deposit, about the size and form of an almond. During all this time, for fourteen days and nights, relays of students watched this man; during all this time he received nutriment only sufficient to support life, until the tumour was consolidated; during all this weary time, day and night, ice was kept applied to the tumour. I must add here, the controlled will and temper of the man aided in a marked way the rigorous treatment to which he was subjected, and tended to the end so strenuously sought after—his perfect recovery." I have frequently seen this young man since, and he remains perfectly well. As warmly as I advocate the practice in certain cases of "not searching by operation for the wounded artery, unless bleeding is going on," the more strenuously would I enforce the propriety of at once cutting down upon the injured vessel if it is of magnitude and if the bleeding is going on, or enlarging the wound so as to secure it. Several cases are related in my work on "Operative Surgery" in support of such practice.

The case of P. C., detailed in the commencement of this paper, is a striking example to show the absolute necessity of doing everything possible, no matter how hopeless a case may appear. The man was subjected to the most rigorous treatment, and which in the end proved beneficial in saving his life. He was dismissed from hospital, cured, May 9, 1878, thirty-three days after his admission.

CASE V.—*Very large Spina Bifida involving the Cervical Region; New Operation; Chemical Analysis of the Fluid, most accurately taken, disproving many of the ideas floating through the class-books.*—M. D., admitted to Sir Patrick Dun's Hospital, October 2nd, 1876, aged ten months. She was the fifth child, and of apparently healthy parents. She had spina bifida implicating the entire cervical spine from the occiput to the second dorsal vertebra, all the spines and laminae of the vertebrae being absent. The tumour was very large, measuring around its circumference twelve inches and a half, in its transverse axis eight inches three quarters, and in its vertical six inches and a quarter. The tumour was very tense, and covered by quite healthy integuments. Pressure upon it neither emptied it nor scarcely reduced its size at all, and gentle pressure upon it did not stupefy the child in the least. The coverings, as I have mentioned, were thick and healthy. I must digress for a moment, and make the following observations:—In many instances I have cured umbilical hernia in childhood by the following method, which I have carried out years since and up to the present time with unvarying success:—After taking the little tumour, and grasping it steadily with the fingers of the left hand, and then with the right gently pressing back the



MR BUTCHER'S REPORTS ON OPERATIVE SURGERY.

ENLARGED OCCIPITAL BONE
TREATED BY A NEW OPERATION.

protruded intestine, at the same time catching up the integuments covering the receding bowel and drawing them out forcibly—then using a long strap of adhesive plaster twelve or eighteen inches long and quarter of an inch wide, steadily applied round the drawn-out coverings of the hernia, first laid on close to the abdomen, and then rolled gently yet firmly along from the abdomen to the very end of the coverings as drawn out—thus stands out a firm hard pedicle, varying from three-quarters of an inch to an inch and a half in length, determined, of course, by the extent of the protrusion. This application being reapplied every second, third, or fourth day—always replaced before the plasters soften or rather relax—so that the bowel should be prevented from protruding again in ever so minor a way until the fresh adjustment had been made. This treatment, if carefully persevered in as I have directed, will effectually cure the hernia in two or three months at furthest. The serous surfaces, applied and held together, become united, the aperture is shut up, and the outside pedicle contracts, shrinks up, and is ultimately taken away altogether. I have had very many instances of success following the mode of treatment I have just alluded to. This same mode of treatment, upon the same reasoning, I applied to this most remarkable and serious case of spina bifida. On the 6th of October I operated after the following manner:—Having placed the child resting on its nurse's shoulder I punctured the most prominent and central portion of the tumour with a fine trochar and canula, and as this hesitated at entrance (though a well-fitted instrument to its cannula) I did not use any force or pressure with it, but substituted a grooved needle, which readily passed through the coverings, and as the fluid flowed off very slowly I gradually and steadily caught between my thumb, the index and middle fingers of my left hand, the collapsing sac, and held it guardedly compressed while yet the fluid flowed through the needle. I drew off only two ounces and a half of the fluid; and then, the instrument being withdrawn, with my right hand I rolled a long narrow strap of adhesive plaster round the collapsed sac between my fingers of the left hand, beginning close to the tumour and firmly and steadily outwards, the strap following closely on my fingers as I withdrew them. Thus the most prominent part of the sac surrounded by those turns of the plaster was perfectly occluded. No uneasiness or suffering was evinced by the child, though the tumour was considerably diminished by this management. Some French wadding was placed over the tumour, so that no hard pressure should be exerted on the plaster, and so irritate the tender skin. The fluid was perfectly pellucid; specific gravity, 1.007. On the 7th and following days no uneasiness, fever, or irritability from the operation. The plaster held its grip well on the portion of the sac enucleated. On the 10th I again drew off two ounces of fluid in a similar way to that described, by the grooved needle entered above the

first wound. I wished to be above the centre, no depending point, as I wanted to guard against any fluid escaping after I drew off what I thought sufficient. After the discharge of the fluid the tumour was greatly diminished in size, and I applied the plaster as before, constricting far more the tumour and materially reducing it, certainly by less than a third of its original bulk. The fluid drawn off was two ounces; it was slightly turbid, and minutely tested for sugar. This point closely concerned a great surgical problem, for it had been stated as a diagnostic mark of water welling from the ear in fracture of the base of the skull that sugar is present in it, which at once confirms the accuracy of the diagnosis of fracture. To this point I shall refer again. On the 14th the little child showed no distress or uneasiness after the operation two days before. She took the breast as usual, and slept quietly, and when awake was as lively as before any operative interference. The plaster held its grip and place undisturbed, a very large part of the sac being tightly embraced. The mother had now to go to the country, some of her children being very ill, and she would take the infant with her, promising to come back in a few days. This, however, never happened, as the infant took scarlatina in the country and died. I have no doubt whatever, had the child lived, and had the same treatment been carefully carried out, from the great diminution effected in so short a time, that the operation would have been successful.

In this case there are a great many points of interest. First, the enormous size of the tumour, embracing the entire cervical region, and even beyond, this position being the rarest of all for its presence; yet instances are mentioned by Cruveilhier and others, but not one so large as mine. The operation which I planned and successfully employed is, I think, worthy of a trial. Mr. Gross, in his splendid work on "*Operative Surgery*," thus speaks of the efforts made to cure spina bifida:—"The treatment of bifid spine is anything but satisfactory; for modern science, while it has been so suggestive of improvement in almost every other branch of surgery, has made no additions, even of a plausible nature, to what was known respecting the management of this malformation a quarter of a century ago."^a

I can with the greatest certainty and confidence recommend to the profession the operation the steps of which I have endeavoured to describe, and have no doubt that in other hands, when carefully carried out, they will be equally promising, as in the embarrassing case which illustrates my views.

^a Gross. *System of Surgery*. Vol. II., p. 187.

On October 6th, and subsequent days, a most careful and close analysis of the fluid drawn off was made in the laboratory of Trinity College Medical School with the following results:—

Specific gravity at 60° F.,	-	-	-	1007·58
Albumen,	-	-	-	a trace.
Chlorides,	-	-	-	abundant.
Sulphates,	-	-	-	a trace (minute).
Ammonia (free),	-	-	-	none.
Alkaline Phosphates	-	-	-	a trace.

No sugar, either by copper or saccharometer tests. This point was determined both before and after the separation of the albumen from its fluid.

The chlorides, estimated as chloride of sodium, were found to be 63·4 of the entire solid matter.

The fluid drawn subsequently by grooved needle gave exactly similar results, except that a small amount of blood escaping along the needle gave a small coagulum, which separated from the fluid.

I lay great stress upon the fact that no sugar was found, though most carefully looked for both by the copper test and by the action on the plane of polarisation of light. The polariscopic examination was made by Professor Jellett, now Provost of Trinity College, Dublin. This last point was looked to with the greatest care, as the presence of sugar, as I have before stated, is asserted to be a chemical test of real application in cases of injury of the head when the cerebro-spinal fluid is observed to escape. I quite agree with Roberts that the fluid that escapes in those cases of fracture of the base of the skull, at least in most cases, consists of the cerebro-spinal fluid, because there is no other source within the skull than the pia mater which can yield with equal rapidity so large a quantity of fluid; experiments on animals having shown that the cerebro-spinal fluid is rapidly reproduced after its evacuation. The quantity of fluid that is thus discharged is always very considerable, the pillow usually becoming soaked by it. It is often necessary to keep a piece of sponge or a pledget of lint against the ear in order to prevent the fluid from wetting the patient as it trickles out; and if a cup be so placed as to collect it, an ounce or two will speedily accumulate. Langier states that he has seen a tumblerful discharged in a short time, and as much as twenty ounces have been known to be poured out in three days. The

flow is usually continuous for several days, and then ceases. In order that the fluid be discharged the membranes of the brain must have been torn opposite the outlet by which it is poured forth. This has actually been ascertained to be the case by carefully conducted dissections. When it is discharged through the ear the laceration, as Bernard has remarked, must have extended through the *cul-de-sac* of the arachnoid, which is prolonged along the auditory nerve in the internal auditory canal. C. Bernard states that sugar is contained in it, and forms a sure test and proof that may be relied upon as to the certainty of fracture. Now the cerebro-spinal fluid drawn off from the spinal tumour, and of which I have given the most strict analysis, did not yield on the most delicate tests the least trace or evidence of sugar.

In many of those cases of spina bifida, related by various authors, neither the cord nor the nerves had any connexion with the sac—these parts followed their usual course down the spinal canal; but in far the greater number of cases that have been placed on record the nerves presented some kind of connexion with the sac. Hewitt states that of twenty preparations of spina bifida occupying the lumbo-sacral region, which he examined in various collections, he found but one in which the nerves were not connected with the sac, or if so, their functions at least were not interfered with by the gentle treatment pursued. I believe myself the implication of the nerves with the sac would be far more likely to occur when the tumour sprung from the lumbo-sacral spine than when it did from the cervical region.

CASE VI.—*Extensive Disease of the Lower End of the Thigh-bone ; large projecting piece threatening the Popliteal Vessels ; the entire cut out by a most formidable operation ; Perfect Recovery, with entire use of the limb.*—The following case is one of the deepest interest, involving the life of a fine young man ; and he was dying when he came under my care. He is, I am most happy to say, perfectly well, and has been obtaining university honours. I have a letter from his father, and from which I extract the following :—

“My son, John H. R. G——, on the 25th March, 1876, sprained his leg (as we considered at the time). A doctor saw him next day, and ordered a liniment, but said at the same time he was suffering from an attack of jaundice, and treated him accordingly. The next week he called in a doctor to see the leg. They both examined it, and the result of their conference they agreed to, and ordered a stronger liniment ; in a few days applied poultices, afterwards leeches and fly

blisters, and returned again to poulticing the swollen part in the inside of the joint. The discharge was matter and a quantity of water. After some time an abscess formed on the outside of the joint, and was in due time lanced by the same doctor. In a few weeks another followed, and broke of itself, from which time, for more than a year, not less than a dozen formed and broke in succession. Several small particles of bone came away during the first two years; since then he has had no abscesses, nor has any more bone appeared. Shortly after this great constitutional disturbance, increased discharge and feverish symptoms; chest also very uncomfortable."

On the 6th November, 1880, I was called upon to see this young gentleman by Dr. Nolan. I was at once struck by his emaciated and enfeebled state, showing there was some marked disturbance interfering with nutrition, health, and life. I was told a long history—how his right knee-joint was injured, how it was twisted, and how his sufferings after could not be described; the abscesses and the openings about the joint I have just adverted to; and all this sad history carried on for years—I was told, I think, nearly three years—all going still to the bad; then I was called in to see this young man. After examining very carefully, I found he was greatly depressed and weakened from the persistent pains around the knee-joint, constant stricture in it preventing all sleep, and latterly accompanied by profuse perspirations. His pulse was at this time 120, and his temperature ranging up to 100°. He was sadly reduced, and feeble as a child. After examining his constitutional condition, I then carefully examined his knee; there were two openings—one on either side of the joint; the one on the inside was of long standing, while the external one was made by the doctor who attended him. On passing carefully a probe into the external aperture it traversed into the popliteal space, and detected in its whole travels diseased bone (carious), and on passing the probe through the opening on the inside of the joint the same condition was clearly revealed. By this examination I clearly detected a long, sharp piece of the femur, sticking down towards the popliteal vessels. This condition made me exceedingly anxious as to the necessity and propriety of immediate interference. I explained to his father my views upon the case—told him of the extreme disease in the lower end of the femur, threatening the implication and the destruction of the knee-joint, not only that remotely, but immediately; the danger that imminently hung over the large vessels (the popliteal artery) in the ham, from close proximity to the sharp solid piece of bone that hung down in this direction. I have frequently before this been called upon to remove sequestra and portions of bone protruding from their natural site, and even set loose in this space, always threatening the greatest danger by inflicting mischief on the large vessels. In my work on "*Operative Surgery*" some interesting

eases bearing on this point are very carefully related. Latterly the disease progressed so rapidly, and the constitutional symptoms assumed so severe a type, that the lungs were threatened—in fact, there was slight dulness in the right lung and upper part of the left lung, in their apices, with distressing cough, so that I looked upon the knee affection as the primary source of the fatal mischief which threatened the chest. After careful thought and consideration I determined on cutting out the entire carious portion of the lower end of the femur, as well as the sharp projecting piece which threatened the life of the popliteal vessels. Having examined with the greatest carefulness into every part of this very serious case and considered it in all its bearing, and having made up my mind as to the course to be pursued, I brought in my very able friend, Surgeon Wheeler, and expressed my views to him, and how my efforts were to be carried out. A few days were passed over in preparing the patient for this very formidable ordeal.

On the 20th November, 1880, we determined on this operation. Dr. Nolan, who watched over the case from the very first, administered the ether; an assistant was there to hold and control the patient. Surgeon Wheeler ably assisted me in the different steps of this difficult and dangerous operation. The patient being placed under the full and steady action of ether, the limb extended, I made an incision fully five or six inches long on the outside of the lower part of the femur—the end of it terminating about two inches above the angle of flexure—right down to the bone, but its whole line a little in front of the course of the popliteal vessels; this incision being carried deeper the bone was reached, and then the handle of the knife was used to detach the vessels and all soft parts backwards, so as to arrive at the carious bone. The gouge, the chisel, and the mallet were had recourse to, to clear away all the diseased bone. Copper spatulæ were placed between the vessels, together with the soft parts and the bone, so that they were carefully drawn backwards, free from all danger. The work with the gouge was most satisfactory and very remarkable; large quantities of the carious bone was safely cut away with it, and I cannot give this instrument too much praise. If steadily worked and well handled, with the index-finger of the right hand up to its curved edges, rigidly fixed then, so that the instrument shall not slip, it will do wonderful work and give greater satisfaction than any other tool that can be applied. The gouges I use, some of them, are much larger than those in the operating cases for surgeons, as sold by cutlers.

The cutting force of the gouge in a resolute hand can be made enormous, and its delicate working, held as I have described, may be most gentle, and will effectually remove the smallest projecting pieces of bone that must be taken away. The leg throughout this serious work was slightly flexed, and then more, so as to relax the soft parts and give a

larger chamber to work within. The sharp projecting piece was chipped away. Now, this work was all very difficult, owing to the way in which the large vessels lay so closely approximated to the diseased bone; yet the entire diseased bone was cut out down to the lowest point threatening the knee-joint. The entire chamber from whence the diseased bone was removed was quite smooth and pronounced healthy in every way. The bleeding during the operation was very trifling, though the incisions were extensive. The entire wounded surfaces were freely brushed over with a very strong solution of chloride of zinc (my usual practice), and then the cavity was filled by long strips of lint, soaked in oil, containing two drachms of castor oil and one drachm of watery extract of opium to the six ounces. The limb was then placed upon a padded splint, the concavity of the ham being well filled up. The splint extended from the tuberosity of the ischium to the centre of the lower third of the leg, and was maintained in its position by being bandaged from below upwards with a gentle steady pressure, which maintained and quieted the spasmodic tendency beginning to be shown in the muscles of the thigh. The young man quickly rallied from the effects of the ether, and stated he felt no pain at any time during the operation.

In an hour afterwards a sedative draught was given, and he fell into a quiet sleep. At 4 o'clock I visited him; there was no blood weeping from the wound, and he had no pain. Visited again at 10 o'clock, and he was very quiet and free from pain. Repeated his sedative draught. He had taken some beef-tea twice through the day—to be given again in the night when awake. A whole week passed over without an unfavourable symptom. The dressings were carefully applied by myself; a healthy purulent discharge was quickly set up, quite healthy in character. The third day after the operation the pulse came down fifteen beats, his temperature fell two degrees to normal, and on the fifth night after the operation all sweats ceased—at the end of a fortnight improvement progressing in every way, and now, too, his cough ceased to be so troublesome. At the end of a month his cough ceased altogether, and distress in the chest was nearly gone; dulness in the apices of the lungs clearing rapidly away.

For many days after he was carefully watched and dressed, and all went on most favourably. Still the same restrictions as to any attempt at motion. The wound discharged freely, as it ought, a fair quantity of healthy pus. Nothing occurred requiring special notice for two months. The discharge gradually diminished; there was no pain, no restless nights; the pulse quiet at its normal range of 78. All the lymph and thickening material for bone thrown in front of the lower part of the femur was steadily and gradually diminished; the same careful, cautious dressing of the wound persisted in for several weeks.

The same cautious local management of the case was carried out steadily by myself, as well as constitutional treatment, meeting every trouble that presented itself; and now, before sending him to Bray in May for change of air, to give more oxygen to his system, more tone and life, I wish to state at this time that his constitutional condition was remarkably improved in every way, and this state, I think, may be taken as the index to his local condition. From the time of his change to the seaside his appetite increased, his sleep became steadier and more refreshing. The pains in the limb were never referred to now; there was scarcely any discharge from the wound. He was not more than a fortnight at this lovely and salutary place than he was remarkably improved in vigour, strength, and cheerfulness. In a few weeks after this there was scarcely a drop of discharge from the wound, and he could move about quite independently on crutches, and even placing some weight on the limb. He returned from Bray so much improved in strength and in the power of the limb that he can walk without sticks or crutches, and now (Jan. 3rd, 1881) he has walked into my study without the slightest halt and without any stick or support. There is not the slightest halt in his gait; he is strong, well developed, and well nourished; there is no discharge; the limb bends far more freely, and he can walk quite independently for a long time. He is now enabled to prosecute all his studies without interruption, and he feels set free and released from all fear of injuring the limb. He has recently been examined by Surgeon Wheeler, who was astonished at the result of this case in such a short period of time.

This case I look upon as a very remarkable one, rescued from death by very bold and determined treatment—conservative surgery.

Before closing this paper on remarkable cases in operative surgery, I would wish to give the history of two cases of the very worst forms of hare-lip—one of the double form, with cleft palate hard and soft, with the most unnatural development of the vomer and intermaxillary bones, standing straight forward from the very tip of the nose, the entire nose strangely developed in size, and thrust over to the left side. The second case has likewise been selected from amongst many as an example of single form on the left side through hard and soft palate, very wide in front, the gap freely admitting the thumb, and this space being due to the remarkable way in which the united ossa incisiva attached to the right superior maxillary bone stood prominently, almost straight, forward, and even above and to the right of the tip of the nose; the right ala was curved and expanded upwards and

outwards, while the left ala was corrugated, depressed, and dragged down to the undeveloped left superior maxillary bone. In my work on "Operative Surgery" I have dwelt largely on the subject of hare-lip, and illustrated my views about its treatment in all the most embarrassing cases to be met with. I likewise, in *The Dublin Journal of Medical Science* for 1877, described two rare and terrible cases of double complicated hare-lip in mother and child, each accompanied by the most horrid deformity. There is no such instance on record as the mother and child presenting themselves for operation at the same time for the same frightful deformity. The cases are beautifully and most accurately illustrated, both before and after the operation, by lithographs traced from photographs. The beautiful plates represent the front view of the mother and child, the child sitting in his mother's lap, and so also a plate of the side view of the mother and child before the operation. The next plate, subjected to the same ordeal, represents a front view of the mother and child in the same position as taken at first after the operation, and another plate shows the side view of the patients after the operation. They are perfect, I think, in every way.

I could not refrain from bringing forward these cases, each being so typical of its class. There is another reason too which actuates me to do so, and that is to draw attention to the admirable paper on this subject by Surgeon Wheeler, published recently in *The Dublin Journal of Medical Science*—a paper which, I think, reflects the greatest credit upon him as a most accomplished surgeon. In the City of Dublin Hospital most of his numerous cases were operated upon. I had the pleasure of seeing him execute many of them, and was always pleased with the rapidity and steadiness which completed each operation and the admirable results following.

CASE VII.—*Double Complicated Hare-lip, with double cleft palate hard and soft; projecting intermaxillary bones united in a solid mass, the vomer being greatly thickened and expanded from the point of their attachment—the entire standing prominently forward, with four crooked teeth; the nose was thrust entirely over to the left side, its massive apex pointing more remarkably in that direction, while the alæ were spread out quite horizontally, so that a more hideous arrangement could not be depicted; Cured without deformity.*—E. W., aged six years, the daughter of healthy and well-looking parents, without the least irregularity either in mouth or lips. This infant was the first child; three have been born since, all healthy

and no mark whatever. I had seen the child when an infant, and several times at intervals of some months after. From the first it was such a puny little creature, with so little vitality about it, that on several occasions, though severely pressed, I declined to operate until the child should gain age and strength, as the operation should be a most severe one, owing to the extensive and horrible deformity present. For twelve months and up to the present time, November, 1878, the child was kept near the seaside, and most carefully fed and attended to, and so the child steadily improved, and now it was brought up from the country for my opinion. I considered it in a sufficiently healthy and strong state for the operation. The fearful amount of deformity in this case exceeded anything almost that I had ever seen; the superior maxillary bones on either side were very imperfectly developed, while the entire nasal organ was enormously enlarged; the soft and hard palates were altogether absent, and the vomer was inordinately developed, proceeding from behind, about its normal size, and thickening for about half an inch, it began gradually and rapidly to increase its dimensions, and, as it approached the intermaxillary bones, was fully half an inch thick, forming a great unsightly buttress, on the front of which were impacted and grown into the two maxillary bones, standing prominently forwards, almost directly forwards. These bones were unnaturally large and covered with thickened gum deposits on either side, the entire piece standing almost straight out and an inch across, while its depth was three-quarters of an inch; four small teeth stuck directly forwards out of this protruding mass. The depth of the vomer in front, where fused into this mass, the mass being partially covered by a small piece of integument, was quite unnatural, being just an inch, while its massive thickness was, as already mentioned, inordinately increased. This osseous arrangement made the whole nose stand forward more than a half greater than it ought to be, while the whole organ, septum and intermaxillary bones, were united somewhat to the left side. The *alæ nasi* were much longer than natural, dragged outwards almost horizontally, flattened and matted, far away from each other, into the undeveloped superior maxillary bones. At the period of life of this patient with double complicated hair-lip the tongue is always greatly enlarged; so here, the organ was fully half again its natural size—this increase of size, this enlargement, adds greatly to the difficulty of getting safe union after operation, as it becomes troublesome, not only by its bulk and motions, but by its determined pressure forwards. Considering all the points in connexion with this very serious case, the hideous deformity and the magnitude of the central mass, the removal of it, to a certain extent, being absolutely essential to allow of the formation of a septum between the nostrils, the formation of this and the closing up of the great gap in front, created such an amount of work—work that should be quickly done—as to

Fig 1



Fig 2



Fig 3

Fig 4

make the surgeon very anxious and reliant on himself in undertaking so arduous a task. I shall now proceed to describe the several steps of the operation:—

On November 8th (Friday), 1878, the child was operated on after the following manner, and more assistants were required than usual for the operation of hare-lip, owing to the advanced age of the child and the numerous complications which had to be dealt with:—The child being rolled up in a sheet, mummy-like, the arms steadily secured downwards, the feet also steadily bound together, was given into the arms of a strong young man, sitting in a high chair, with the patient's head resting on his left shoulder. The head was then steadied in this position by a second assistant standing behind the patient; a third assistant stood at my right side to compress vessels, &c. Standing in front of the patient I passed a tenaculum into the central fleshy flap partially covering the projecting intermaxillary mass, a little to the right side of the mesial line, and dissected it up rapidly *from the bones far back*, fully an inch and a half. I proceeded next to deal with the osseous projecting mass, clipped it across high up at its most projecting part, and endeavoured to force it back. This not being readily accomplished, with a narrow-bladed forceps I quickly clipped from beneath a large triangular piece, base below; this facilitated the forcing back of the most projecting mass; but, even when so satisfactorily forced back, the posterior prominence was still too great. Cut the thickened septum far behind; the hæmorrhage was so sharp that I thrust a couple of reddened wires into the chief vessels supplying this central osseous mass; but this did not quickly arrest the loss of blood, which was rapid, so I removed the osseous part rapidly with the bone forceps, retaining as much as possible behind to support the central septum formed from the soft part held over the tip of the nose carefully preserved—the thermo-cautery proved effectual in arresting any further flow. A tenaculum was then inserted into the left half of the cleft lip where its red margin curved into the lip—the piece well held up—and it and the left ala carefully detached from the maxillary bone over as far as the infra-orbital canal, and high up, so that when the part was drawn from left to right it readily yielded and came across to what might be considered the desired point. I next inserted the tenaculum through the right side of the lip, and at a similar point to that effected on the left, and so rapidly dissected up the lip and ala from the maxillary bone to a similar distance as that described on the left side; the detached lip and ala were drawn from right to left, and it was proved quite sufficient for juxtaposition with the opposite; pressure was carefully kept on the detached lip on either side to prevent bleeding. All being well freed from osseous connexions I held up the tenaculum through the left half; I applied my curved scissors closely outside the tenaculum, and, pressing it well up to the ala nasi within the nose, cut out the tenaculum with

the transfixed part. In a similar way the right portion of the lip was dealt with. An effort was next made to bring the portions of the lip, right and left, together with the alæ nasi forwards, when it was found that owing to endeavouring to preserve too much of the central osseous part (so essential) the soft parts would not come together without an unnatural strain; therefore I had to resort to the removal of more of the central piece, though influenced by the most determined conservative measures. The hæmorrhage, which again threatened, had to be arrested by the application of the thermo-cautery; the bleeding ceased, and now the parts could come well up and together and meet the central piece, preserved and pared for the septum. A long fine needle was then passed from about a quarter of an inch external to the left ala nasi, and made to travel from left to right, about an eighth of an inch above its curved margin; appearing on the inside, it was made to go through the septal soft triangular piece about its middle (the point of the nose being depressed to facilitate this result, and held so), the needle passing through was forced through the right ala nasi and beyond it about a quarter of an inch through the cheek, corresponding almost exactly to the point of entrance of the needle on the left side; so the needle rested very evenly across, fulfilling every object, bringing up the nose and maintaining the central septum piece in perfect adjustment, on the cheeks being forced forwards. The silk thread was then thrown carefully around the needle in the figure of 8 form—no dragging of the cord, but the soft parts well pressed forward, evenly approximated, and then the cord cast round to prevent the slightest separation or retraction. Thus all these complicated cut surfaces were held accurately in contact and without any biting constriction. A similar needle to the first was now introduced about three quarters of an inch external to the cut surface on the left side, and just at the junction of the red line of the lip and skin, and made to travel from left to right deep through the muscular structure, close to the mucous membrane, and on appearing was carried across, striking the right half exactly at a corresponding point and making its appearance on the right side through the cheek and at a like distance from the cut margin to that on the right side. On pressing forward the cheeks the surfaces readily came into the closest contact—for there was no restraint or tightness in this direction at all—the red margins of the lip so pressed forward most accurately corresponded; and then I cast the silk cord (in figure of 8) from side to side with very gentle pressure, each turn made to lie very evenly, until the entire wound through the red part of the lip was all covered. A third needle was inserted with the same precautions as the previous ones, away from the red margins a long way, deeply through the tip, close to the mucous membrane, so as to bring the part throughout its whole depth into perfect apposition, the cord being

passed around with the same gentle care as the former ones. The parts lay most beautifully together. During these several steps of this complicated operation the child had to be frequently fed with teaspoonfuls of brandy and water. The ends of the needles were next clipped off with the pliers. A narrow strap of plaster was placed on the tip of the nose, and fastened down after the nose was virtually twisted straight from left to right, both to sustain it straight and also to take traction off the central piece. This method I have often adopted and before advised. The wide straps of plaster hollowed out for the chin, and which I have employed for years to keep the cheeks forward and take tension off the needles, were next applied and acted with their usual efficiency. The mode of the application of the plaster which I have over and over laid down in my "*Operative Surgery*" when dealing with the subject of hare-lip, is very simple and most effective. The operation finished, the child was now ordered, according to my usual practice, small doses of laudanum, which quickly quieted her restlessness and irritation—in fact, the infant was half narcotised. The little creature, shortly after awaking, took some warm milk, and again went off quietly to sleep. It is not necessary to particularise the management of the child up to the morning of the 11th. Up to this time she was kept gently under the influence of opium, and took abundant quantities of milk, chicken broth, and rusks grated in it. On the 12th, at 11 o'clock a.m., I removed the needles, having at 10 o'clock given nearly a double dose of the opium mixture, so as to thoroughly quiet the child before putting her to pain. The child was very steadily held resting on the nurse's left shoulder, while the cheeks were gently pressed forwards. I then extracted the upper needle first, catching it in a forceps, having previously greased its ends, and drawing it from left to right, while the index finger of my left hand pressed gently in the contrary direction to which the needle was travelling, and so by this arrangement guarding against any traction here made on the wound. In a similar way the needle upon the red margin was removed, and so also the middle one. When removed, the gentlest touch took away the silk cords which remained lightly glued to the lip. These being very hard I removed them, and then the perfect nature of the operation was all revealed. The nose and septum were perfect, and the incision wounds all thoroughly healed, the lateral sides of the lip most perfectly to the lowest border of the red margin, while the V-shaped piece to make the septum was united with the lateral portions of the lip to its very smallest point. Nothing could be more perfect than the way in which nature responded to all my efforts to secure union throughout. Adhesive straps, very narrow, were then most carefully applied, the cheeks being well pushed forwards, so as to restrain any traction on the recently-united parts; the wide piece of plaster curved under the chin and carried up to the temples, and so fastened as to prevent the slightest retraction of the

cheeks, and so maintaining the newly-united parts in position without the slightest drag upon them. A strap was also placed from the forehead down along the nose, so as to keep its point down, and so resist the dragging up of the central V-piece of the septum. From this the child gradually began to gain strength; beef-tea and chicken broth, with bread crushed up in them, were constantly given, and milk in abundance. In a fortnight after the operation all plasters and straps were thrown aside, and really the condition of the child at this time was everything that could be desired. There was no deformity now. The nose was well up and straight in its position, and the union perfect throughout. No one, as the child's father and mother said, could possibly recognise the child, or believe that such a change could be effected. There is one very important point I shall mention:—Whereas, before the operation, the child made efforts to speak, uttering unnatural guttural sounds, a fortnight after the operation she could speak many words quite distinctly, and in a month could express herself quite intelligibly. The child returned now to the country, and rapidly recovered strength and health after this formidable operation. In eight months after the operation I saw the little child, and scarcely anyone could believe she was the frightfully deformed creature she had been (so truthfully depicted in the picture) before the operation. She was now, eight months after the operation, really a very pretty child, and the marks of the operation were scarcely to be seen, standing at a short distance from her, and the regularity and evenness of her face mainly contributed to this result.

Case VIII.—*Horrid Complicated Single Hare-lip ; single fissure on the left side, through hard and soft palate, very wide in front, the gap freely admitting the thumb, and this space being due to the remarkable way in which the united ossa incisiva attached to the right superior maxillary bone stood prominently, almost straight, forward and even above and to the right of the tip of the nose ; Cured without deformity.*—J. C., aged one year and nine months, first child, born with horrid complicated hare-lip, right maxilla projecting with intermaxillary bones almost prominently forwards; the left maxilla scarcely developed at all—so leaving an enormous gap, the palate being cleft through, hard and soft. The nose, owing to this arrangement, was entirely dragged and flattened on the left side—spread out even on the cheek. The gap in the hard palate was greater than I have usually seen, where only one fissure existed, fully admitting the thumb into it. The whole emaciated and attenuated condition of the little creature was most pitiable when I saw it, four or five weeks after birth—the parents, as usual in such terrible and revolting cases, at once seeking for some operative interference to humanise the deformity. When I saw the child, at this early period after birth, it was barely existing, and the idea of any operation then was out of the



Fig 2



Fig 1 Before operation Fig 2 After operation

question, though I am partial to and sustain the good results of early operation *when practicable*; but the practical surgeon can follow no rule in this respect. It may be very gratifying to parents to try and have an operation performed, hoping always that it must succeed, but the surgeon who has largely dealt in such matters knows well the risks of failure when life is scarcely exerting its proper influences over the nutriment, growth, and development of the little child. At this time I dissuaded the parents from any operation, and now the child has been presented to me again for operation several times since I first saw it and was consulted as to the propriety of operating. On every occasion I advised putting off the time until the little creature gained strength, and now—February 4th—I have seen him again, and he has grown comparatively strong and healthy, though, as contrasted with other children of his age, he must be markedly small, thin, and puny. The face is really fearfully distorted, though there is no second fissure; the intermaxillary bone attached to the right supermaxillary has come to stand even far more prominently forward as they have been developed, and the effect thereby is far more hideous than when the child was a little infant—the first tooth protruding straight forwards, increasing this horrid deformity; and the constant thrusting of the tongue by the child out through the wide gap makes the whole appearance disgusting. The child being now two years old and in good health, I determined on operating upon him.

On Feb. 5, 1880, at 11 a.m., I operated upon him, after the following manner, assisted by Dr. Denham and Surgeon Wheeler:—The child being rolled up in a sheet, mummy-ways, was placed in the lap of a nurse, his head resting well up on her chest; an assistant standing behind steadied the head immovably in this position. I first thrust a tenaculum through the right half of the lip, just at the margin of the red border at its outer part, when, being connected with the white skin, I gave it to an assistant to hold; in a similar way I trans-fixed with a second tenaculum the left border of the lip, sunk down, depressed, and pinned in tightly to the undeveloped left maxilla, at a similar position to that on the right side—that is, where the curve ceased and the red lip joined with the white skin. Yet here the tenaculum was inserted steadily and accurately. This too was placed in the hands of an assistant. I now took the tenaculum on the right side from the assistant, and, having made traction forwards and outwards, revealed the mucous membrane, binding the lip to the jawbone and ossa incisiva. With a sharp narrow-bladed scalpel the soft parts were rapidly dissected up from the bones and very extensively outwards, so as to allow the lip great freedom, and so expose extensively the projecting ossa intermaxillaria and the anterior edge of the perfectly developed superior maxilla. I next, with my lateral-bladed forceps, clipped across the

bony projecting arch formed by the maxillary and united intermaxillary bones just at this junction. The instrument divided their junction a little above the alveolar range. I next cut, with the vertical-cutting forceps, the pedicle connecting this prominent piece with the vomer. The projecting bony piece thus cut externally and above—the soft parts all around it uninjured owing to the construction of the forceps—was then caught in a pliers, the jaws of which were covered with two layers of chamois leather so as to prevent bruising or excoriation, was bent back and forced from right to left into the gap, thus making the alveolar range perfect in form. The force brought to bear by the pliers was so steadily applied and as close as possible to the osseous divisions, that the piece went back gently, without starting from their bed either of the pieces or the teeth. I then seized the tenaculum in the right part of the lip, and fixed its connexion to the maxillary considerably backward, satisfying myself that it would come well over to the left side, and without much traction. This being satisfactorily arrived at, I then took hold of the tenaculum inserted in the left half of the lip and lifted it upwards and outwards. It was necessary here to make a very extensive dissection. The left superior maxilla was so miserably developed that the lip was tied back more than a quarter of an inch, and the left ala of the nose completely flattened, spread out quite with an inclination *downwards* and *outwards*, and firmly bound to the bone. The dissecting up of the lip was very troublesome, so as to free it sufficiently to come forwards towards the right side, and the dissection of the spread out nostril from the bone required much caution, the division requiring to be effected close up to the inner angle of the eye. The parts being sufficiently freed they were gently drawn over to meet those on the right side, and were found admirably adapted for apposition with the opposite side.

I then took in my left hand the tenaculum, thrust through the right side of the lip, drew it steadily forwards and a little inwards, making it quite tense. I then passed the curved scissors that I am in the habit of using beneath my left hand, laying the instrument with its curve towards the mesial line upon the lip, close to the outer surface of the inserted tenaculum, pressing, at the same time, the instrument well up, so that its points should be within the nostril when the division of the lip was accomplished. The instrument being thus steadied in its proper site was firmly and rapidly closed, dividing at one stroke all that was required to be taken away, and thus cutting out the tenaculum with the soft parts. In a similar way I lifted upward and a little inwards the left tenaculum, so making tense the left portion of the lip; to this, also, the curved scissors was applied at the outer surface of the tenaculum, and the soft parts cut away up into the nostrils. There was scarcely any blood lost, pressure being effectually made on the facial artery on either side. The

two concave surfaces, when thus approximated, fitted together most evenly from the nostril to the lower edge of the red border. The first needle I inserted a quarter of an inch external to the left ala of the nose, and on a line with its lower edge. This was made to travel from left to right through the thickness of the lip, until it appeared on its cut edge close to the mucous membrane. It was thrust on so as to strike the cut edge of the opposite side close to the mucous membrane, and so on until its point appeared on a line with the right ala of the nose, and at a similar distance from the cut edge to that on the opposite side. The needle lay perfectly straight across, the parts were pressed from behind forwards towards each other upon the needle, and they came most evenly together with scarcely any strain; and it was most remarkable how beautifully the left half of the nose, which was so distorted and spread out, at once came up into symmetry with that on the right side. A few turns of silk thread were cast in figure of 8 form around the needle, the parts being well forced in upon the needle in very accurate contact before the thread was thrown round, so as to prevent their receding again; thus there was no sharp pressure made by the cord. The second needle was inserted at a similar distance from the cut margin as the first, and exactly at the junction of the skin and red border of the lip on the left side, and made to travel through the lip close to the mucous membrane to the opposite side, and enter exactly in a corresponding position, and made to appear above the red margin at the same distance from the cut surface as that on the opposite side. The cheeks were shoved from behind forwards, and the surfaces pressed closely and evenly together. Nothing could be more perfect than the way in which they lay together. I was most particular in throwing the cord about the needle in the figure of 8 form, so as not to strangle the tender soft parts over the needle. Each turn of the cord was made to lie most evenly, the *first being from above*, and so on alternately until the cut red border was nicely covered and supported. The third needle was placed between both, and the cord cast around it with similar precautions to those already used. The ligature around the first needle was then turned a few more times, in order to give a wider support. The ends of the needles were then cut off with pliers, and a narrow bit of sticking plaster placed between the clipped edges and the skin on either side. Then the cheeks were well pressed forwards, and I applied, as my usual custom, a large piece of sticking plaster, hollowed beneath, to go under the chin, and the wide portions passed upwards to the temple on either side, and so restraining the cheeks from going backwards again; by this means all tension was removed from the needles. I put the child at once on small doses of opium. The following is the form which I have adopted for many years:—℞. Tinct. opii gutt. x., olei anisi gutt. x., syrup alb. ℥iii., aquæ ad ℥ii.; a teaspoonful every third hour until quiet and dozing are secured.

6th.—Child took abundance of warm milk, and slept lightly and quietly from the administration of the mixture; no crying; parts all look very well.

7th and 8th.—Child going on most favourably; swelling considerably abated, and takes quantities of milk; also continues the sedative mixture.

9th.—Removed needles this day. Ninety-six hours after the operation, having as in the previous case given nearly a double dose of the opium mixture to quiet the child, the entire wound healed most evenly and beautifully throughout, from within the nostril to the very lowest point of the red margin, and the red lip naturally pouting (no notch), from the admirable way the coneave wounds lay together, and thus projecting slightly the lowest border of the lip. Applied several straps of plaster to sustain parts together, pressure being made upon the cheeks, forcing them forward during the entire dressing. The wide piece of plaster was then applied, as before stated, to take the place of the assistant's hands in keeping the cheeks forward and relaxing the parts external to the united wound; the child all through the day took milk freely and his bottle occasionally.

10th.—On calling to see the child this morning at ten o'clock, I was at once told that one of the servants went in to play with the little fellow when his nurse was away, and he was forced into a fit of laughing, and in the effort he opened the lower part of the wound in the red border, and it bled very freely. In order to rectify the mischief I cleansed away all blood, refreshed the edges of the gaping little bit, and passed a needle from left to right just at the juncture of the red border and the skin and a little external to the point first selected; this was carried across to a corresponding point on the opposite side, and a silken thread thrown most cautiously around it in figure of 8 form; this brought the surfaces most accurately together. A couple of narrow straps were placed between this suture and the nose, so as to support the lip above; the wide strap was then put on to maintain the cheeks forward as before. Visited at 3 and at 8 p.m.; child has taken quantities of milk and also his bottle, has been kept perfectly quiet, and sleeping lightly all day; the lip looks perfectly glued together.

11th.—The child slept quietly, the mixture being administered every fourth hour, and drank nearly a quart of hot milk through the night; the little creature is quiet, and the edges of the lip seem glued together; no gap whatever beneath, and there is no tension on the needle.

On the 14th—ninety-six hours after the insertion of the needle to rectify the mischief that had been done—I carefully withdrew it; the threads been adherent lightly I let them remain, and placed the strap under the chin from temple to temple to keep cheeks forward, and a single strap across.

15th.—Removed all, and found the union perfect throughout from the

nostril to the lowest part of the red border of the lip—in fact, it was most remarkable how such perfect union was obtained after the violence which tore open the wound after its first perfect cohesion.

17th.—The union now is everything that could be desired; the nose is perfectly straight—no twist on either side—the upper lip is perfect throughout, the union of opposite sides being most accurately accomplished; and, when the little creature smiles, the little incisor milk-white teeth appear in their natural curve, proving above all things the necessity for preserving the intermaxillary bones with the little teeth. This, however, cannot be done by violence; the osseous piece between the intermaxillary bone and the maxilla must be all cut through with my instrument, and the osseous ridges from the vomer likewise perfectly, before force should be applied to turn it into the gap towards the opposite maxillary bone. If the osseous attachments are correctly divided the force required to turn over the projecting piece into the place that it should occupy will be so trifling that the little teeth or the source from which they spring will not be interfered with or damaged. So it was in this very remarkable case. The parts are again well sustained and supported together by adhesive straps, so as to take off muscular action from any traction on the recently-united parts.

20th.—All straps now removed, and nothing could prove more successful than the operation. The nose is perfect, not in the least degree flattened or dragged, the lips are beautifully united throughout to the very lowest edges, and, at a little distance, the marks of the operation are scarcely perceptible. When the child smiles the mouth is quite evenly drawn upon, and there is not the least deformity left.



